What Can NCAST Do for NARA?

The National Archives Center for Advanced Systems & Technology (NCAST)

What Can NCAST Do For NARA?

- Help NARA to identify technical competencies needed for managing the lifecycle of records in e-government
- Help NARA evaluate optimal sources and approaches to deliver needed competencies
- Contribute to development of critical competencies by NARA staff members
- Identify and evaluate technologies and methods that could be used to improve lifecycle management of records
- Explore possibilities for addressing lifecycle management requirements that are beyond the state of the art of IT, computer science, or archival science.

Concepts

- electronic Lifecycle Management of Records (eLMR)
  - Management of electronic records across their lifecycle
  - Application of IT to the management of all records
    - In any case where NARA needs to deal with them, not just ERA.
- Competency: knowledge and/or skill that can be applied in NARA operations.
- Technical competency: knowledge and/or skill in information or networking technology.
- Sources of competency: individuals or organizations who can supply a needed competency; e.g., staff, consultants, contractors, other archives.
- Research: an activity that creates new knowledge or information, as opposed to learning, where individuals acquire knowledge or skills that are new only to them.
  - Applied research aims at determining whether and how NARA could use existing technologies or methods in its operations
  - Advanced research addresses NARA needs for which there is no available solution or support in information technology or computer science

How Can NCAST Help NARA Identify Technical Competencies Needed For eLifecycle Management of Records?

- Manage a NARAwide project to identify technical knowledge and skills needed for eLMR
  - Specify the activities in which particular competencies are needed
  - Determine how each activity contributes to accomplishing NARA's mission
  - Characterize the level of knowledge or skill needed in each activity
  - Identify where in NARA organizations these competencies need to be applied
  - Determine frequency of need

How Can NCAST Help NARA Identify Technical Competencies Needed For eLifecycle Management of Records?

- Generate a comprehensive, NARAwide overview of technical knowledge and skills needed for eLMR
  - Specify the activities in which particular competencies are needed
  - Indicate how each activity contributes to accomplishing NARA's mission
  - Characterize the level of knowledge or skill needed in each activity
  - Identify where in NARA organizations these competencies need to be applied
  - Determine frequency of need

Levels of Competency

- Basic: knowledge or skill in use of common IT applications and tools
  - e.g., desktop tools, ARC, ERA, ARCIS, ….
- Specialized: knowledge of technologies used in a particular area of lifecycle management of records; skill in use of special purpose tools
  - e.g., for digital photography, familiarity with common formats and common software products and their relative strengths and weaknesses; for preservation, ability to use transformation tools available in the ERA Preservation Framework.
- Advanced: ability to use IT tools or services beyond the level of end users
  - E.g., an end user at the basic or specialized level could open, fill in and route an online form or execute a defined workflow. Someone working at the advanced level could create and modify forms and reports, or establish or modify a workflow. This would involve using software products that require configuration, but not programming, which would be at the expert level.
- Expert: ability to conduct in depth analysis of challenges or technologies; ability to develop or modify software, or to configure systems.
  - E.g., quantitative assessment of the scalability of a proposed hardware or software solution.

How Can NCAST Help NARA Evaluate Optimal Sources And Approaches To Deliver Needed Competencies?

- Advise NARA in identifying potential sources of needed competencies and in evaluating their strengths, weaknesses, and risks.
- Potential sources
  - Staff
  - Contractor
    - On-going
    - Ad hoc
  - Collaborator: other institution or group which shares common interests with us
  - Combination
    - Possibly different combinations of sources in different activities

Options for Distribution of Technical Competencies Among Staff

- Common knowledge needed by all staff in a given job type or functional or operational area
  - E.g., all appraisal archivists should know how to create and review records schedules in ERA
- Organizational units specialized to provide competencies that are needed only intermittently or in specific organizational loci
  - E.g., a specialized unit that serves all Offices might be the best way to provide expertise, such as on complex database systems, that custodial units anywhere in NARA may need on occasion.
- Individual experts to provide high levels of competency in-house
  - E.g., NARA needs its own experts to guide and evaluate work done by contractors
- Matrix & team structures to address tasks or cases which require a variety of competencies

How Can NCAST Contribute To Acquisition Of Critical Competencies By Staff?

- Identify potential pathways for acquiring technical knowledge and skills
  - Implement a knowledge base where staff can easily identify sources and pathways to knowledge and skills
- Facilitate NARA evaluation of potential pathways
- Where appropriate, help NARA Offices implement selected pathways
  - E.g., recommend courses & readings; support developmental assignments in NCAST research projects; advise on other developmental assignments
- Promote communications about IT research and development activities across NARA.

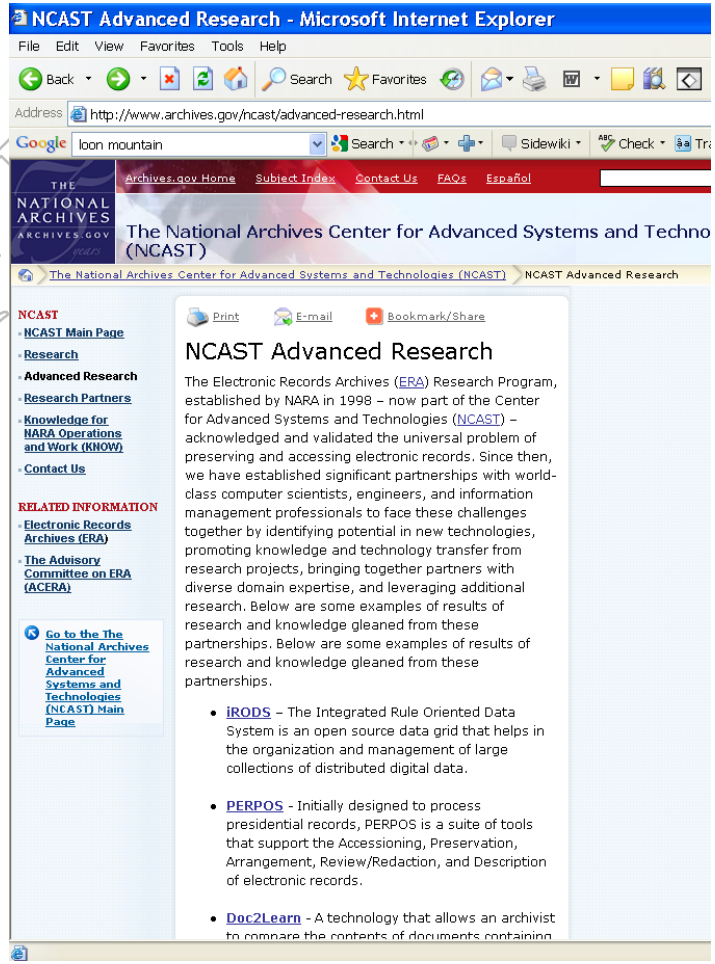
Illustration

Possible Pathways to Technical Competencies

- Classes
- Conferences
- Readings
- Discussion Groups
- Exposure to multiple perspectives
- Mentoring
- Participation in research projects
- Cross training assignments
- Tailored developmental activities
- Just in time learning
- Consultation with experts
- ….

How Can NCAST Promote Communication About IT Research and Development?

- Continuing
  - Sponsor briefings about relevant research and developments to NARA staff
  - Support Cross Training assignments in the Labs
- New
  - Publish information about research activities on the NARA web site (→)
  - Encourage and support participation by NARA subject matter experts in research projects
  - Establish a virtual archives laboratory to facilitate participation by regional staff
  - Establish and support the NARA Information Technology Research Board, with agency wide participation



How Can NCAST Promote Communication About IT Research and Development?

- Establish NARA IT Research Board (NITRB)
- Purpose
  - Identify & coordinate IT research activities related to the lifecycle of records
  - Provide agencywide input to research direction and plans
  - Disseminate information about research progress and results
  - Provide forum for identification and assessment of research needs
- Scope
  - All advanced and applied IT research and exploratory development related to lifecycle management of records that has substantial involvement by one or more NARA offices
- Structure
  - Chair: NH or Director, NCAST
  - NITRB members: a representative of each Office involved in management of records, others as appointed by the Archivist
  - NITRB Liaisons: manager or lead of each IT research project
- Products
  - NARAwide sharing of information about research needs and projects
  - Consensus on priorieties for research
  - Briefings, conferences, publications, etc. about research activities and results

How Can NCAST Identify And Evaluate Technologies And Methods That Could Improve eLMR?

- Assesses concepts, tools and methods for potential application in NARA line operations
- Ensure high levels of technical, archival and records management expertise are applied in selecting, planning for, and executing applied research projects.
  - Use lessons learned and other reviews of current systems and operations to gain insight into unmet or poorly met needs.
- Evaluate new and emerging concepts, technologies and methods for possible application in NARA operations
  - Organize, conduct and participate in IT research that addresses only existing hardware, software or methods.
  - Develop prototypes and other “hands on” experience when needed to gain in-depth understanding.
  - Dialogue with line managers and other NH units to develop adequate understanding of business needs and desires and to appreciate possible issues related to transition from current to new tools.
  - Recommend promising opportunities to managers and system owners
  - Share understanding with those responsible for implementation.
  - Refrain from any development of operational applications or systems to avoid conflict of interest.
- Provide a collaboration space where employees from around NARA can participate in research projects and acquire technical knowledge they can apply in their jobs
- Scope: NARA internal operations and systems, including those used by other agencies and the public

NCAST Activities to Identify And Evaluate Promising Technologies And Methods
(Applied Research)

- Started
  - Establish Applied Research Laboratory
    - include a “virtual archives lab” to enable participation by regional staff
  - Adding Value to the Digital 1940 Census
    - Collaboration with NW & UMD on finding ways to make the digitized census returns more useful to scholarly research
  - Promoting open source tools for digital format characterization and recognition
    - Collaboration with the National Archives of the U.K. and possibly others to improve open source tools for characterizing and recognizing digital formats
    - Participate in Universal Digital Format Registry project: broad international collaboration to develop a common, open registry of data on digital formats
    - Support development of open standards; e.g. OAIS, Digital Preservation Infrastructure Framework
  - IT Watch for commercial and open source technologies that could be useful to NARA
- Proposed
  - Evaluation of digital preservation methods & establishment of NARA preservation standards
  - Applied Research for ERA and the ERA recompete
    - Collaborate with ERA Systems Engineering to look beyond current developments especially to identify technologies relevant to in the recompetition of the ERA contract in 2011
  - Preparation for future transfers of Web 2.0 e-records
  - Collaboration with NARA records management on evaluation of application of advanced technologies to management of current records.
  - Management techniques, tools, and metrics for electronic records.

How Can NCAST Explore Possibilities for Addressing Requirements That Are Beyond The State of The Art?
(Advanced Research)

- Explore issues important to NARA's mission but beyond the state of the art of information technology, computer science or archival science, including
  - Developments in IT and the government's use of it that result in new types of electronic records that cannot be easily accommodated within NARA's current capabilities.
  - New and emerging technologies that offer NARA opportunities to improve its performance
- Align technical research with the direction of the EOP's Networking and Information Technology Research & Development Program
- Sponsor, conduct, and collaborate in advanced research in IT, computer science or archival science.
- Partner with other agencies to
  - Benefit from their established capabilities for research management, avoiding that overhead within NARA
  - Leverage their investments in IT research
  - Promote awareness of the benefits of collaborating with NARA and the need to manage information assets as records
- Participate in archival science research in collaboration with other archival institutions and archival studies programs in universities
- Scope: governmentwide management of the lifecycle of records

Advanced Research Areas

- Architecture and Infrastructure
  - Advanced intrusion monitoring & detection
  - Distributed, light-weight commodity storage components and architecture
  - Analysis of trade-offs among storage capacity, performance and failure recovery
  - Integrated Rule-Oriented Data System
  - Open Source Architecture for federated digital archives *(planned)*
- Electronic Records
  - Tools for automation of lifecycle management tasks
  - Automated e-record & digital format recognition
  - Technologies for highly scalable & extensible ingest for billions of files and highly complex collections of electronic records
  - Visualization of very large collections of electronic records
  - Evaluation of proposed XML standard for encapsulating data objects
  - Preservation of complex engineering and design e-records
- Archival Science
  - Cyberspace extension of archival concepts & methods
  - Competencies for digital curation

For additional information:
http://www.archives.gov/ncast/